

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION JOHN F. KENNEDY SPACE CENTER KENNEDY SPACE CENTER, FLORIDA 32899

REPLY TO ATTN OF:

AA-SVO-3/71-6-2

JUN 8 371

MEMORANDUM

TO:

Distribution

FROM:

AA/Manager, Apollo-Skylab Programs

SUBJECT: SLPD #35, Skylab Mission Evaluation Requirements

REF:

Briefing Note to Dr. Debus from AA, Dated June 8, 1971,

Subject as Above

As discussed in the referenced briefing note, the subject Skylab Program Directive has been formulated with the input and approval of the KSC members of the Skylab Mission Evaluation Panel. Copies of the referenced briefing note and the subject SLPD #35 are attached for your information. It may be noted that the KSC Launch Operations Reports are submitted to the Skylab Program Manager within one month after launch. Otherwise, this SLPD #35 has the same basic mission reporting requirements for KSC as those of APD #19C.

Robert C. Hock

Enclosures:

(1) Briefing Note to Dr. Debus from AA

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(2) SLPD #35

Distribution:

Apollo-Skylab Distribution M

Debus:

SUBJECT: Skylab Program Directive No. 35, Skylab Mission Evaluation Requirements

The attached Skylab Program Directive has been formulated with our Center personnel input and approval. With the exception of the time interval for KSC Launch Operations Reports submittals, this directive is essentially the same as APD #19C, "Apollo Mission Evaluation Reporting Requirements". Under APD #19C, KSC reports to the Apollo Program Director within five calendar days after astronaut recovery; under SLPD #35, KSC will report to the Skylab Program Director one month after each of the four Skylab launches.

A revised version of KPD 8620.X, "Post Launch Reporting Requirements for Manned Missions", will be issued in the near future. The KPD will outline the procedures KSC will follow in formulating mission reports. My staff may also later issue a new KPD entitled "KSC Skylab Mission Evaluation Plan". This latter KPD will cover all other items in the SLPD #35 which are not directly related to mission reports.

Robert C. Hock

3200.138 (Project) DATE
April 22, 1971

SKYLAB

PROGRAM DIRECTIVE NO. 35

TO

Distribution

SUBJECT: Skylab Mission

Skylab Mission Evaluation Requirements

William C. Schneider

Director, Skylab Program

REFS. : (a) Skylab Program Directive No. 10A, Skylab Non-conformance Reporting

and Corrective Action

(b) Apollo Program Directive 19C, Apollo Mission Evaluation Reporting Requirements

I. PURPOSE

This directive is issued to insure that:

- A. Skylab flight mission performance evaluations are effectively accomplished and that necessary mission performance status and evaluation reports are transmitted within the Skylab Program organization and to other elements of NASA, NASA top management, and the scientific community.
- B. Mission evaluation activities are geared to support real-time mission activities, succeeding Skylab mission flight preparations and operations, and the advancement of space flight science and technology.

The reporting requirements contained in this directive shall be considered one element of the total mission evaluation effort. The Centers are expected to establish their own report requirements over and above those specified by this directive to insure proper total mission evaluation.

II. SCOPE

This directive defines minimum planning and reporting requirements and responsibilities in the following areas:

A. Evaluation Planning

A requirement is established for the preparation of a planning document defining the organization and methods of evaluation implementation by each of the MSF Centers involved.

B. Evaluation Reporting

1. Mission events and status (crews, on-board systems, experiments, etc.) reporting required during the mission.

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- Identification of anomalies and performance reporting required during and after the mission.
- 3. Experiment results reporting required after analyses of mission acquired data.

III. PLANNING AND REPORTING REQUIREMENTS

A. <u>Mission Evaluation Plans</u> (KSC, MSFC, MSC)

A Mission Evaluation Plan will be prepared by each Center and submitted to the Skylab Program Director. A preliminary draft will be submitted 15 months prior to the first launch. The final plans will be submitted no later than 3 months prior to the first launch. Each of these final plans is to be coordinated with other Centers before submission to the Skylab Program Office. The purpose of these plans is to help assure timely assessment of mission accomplishments, systems performance, medical conditions, and experiments. The plans shall reflect the reporting and assessment requirements that are needed for real-time support throughout the mission, support for Flight Readiness Reviews for subsequent flights, flight hardware changes for subsequent flights which result from anomalies, and preparation of final evaluation reports. They shall apply to all hardware and experiments associated with the missions. The Mission Evaluation Plans shall be designed to meet the reporting requirements set forth in this directive, plus additional reporting and assessment requirements which the Centers may impose. These plans will include as a minimum:

- 1. Center mission evaluation organizations which are assigned the responsibilities associated with the requirements set forth in this directive.
- 2. Intercenter coordination plans.
- 3. Crew debriefing and management briefing plans and schedule.
- 4. The total reporting and assessment requirements that the Center needs for
 - a. Real-time support throughout the mission.
 - b. Support for Flight Readiness Reviews.
 - c. Identification of anomalies which might result in changes to flight hardware and
 - d. Preparation of final mission reports.

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M. B. Report Requirements

1. Daily Status Reports from the Flight Operations Management Room (FOMR)

a. Basic Report

A daily written report will be issued from the FOMR commencing after liftoff and ceasing with the report after recovery of SL-4. Each report will cover the previous 24-hour period. The concurrence of both MSC and MSFC senior FOMR representatives will be obtained for each report issued. Each report will assess and summarize concisely the new and/or significant occurrences since the last daily report and the status of factors which bear on the probable accomplishment of the mission objectives. The reports will be issued at 0700 local Houston time and will contain the following:

- (1) Mission events and status,
- (2) Systems and experiment status, including identification of discrepancies and anomalies,
- (3) Flight crew status, and
- (4) Consumables usage status.

b. Weekly Report

The daily written report issued from the FOMR on Friday will contain, in addition to the items required for a daily report (Section III.B.1.a.), a summary of the performance of all onboard systems and experiments. The report should summarize the new and/or significant occurrences and performance since the last weekly report. These reports will commence on the first Friday after liftoff and cease on the Friday after recovery of SL-4. The report should identify all significant anomalies which have occurred during the week, as well as significant findings on critical open anomalies. Significant anomalies are those that could create a hazardous situation or could result in a change in timeline for any of the Skylab missions (SL-1, S1-2, SL-3, or SL-4), those that would prevent the accomplishment of a mission objective, those requiring a hardware change or those that could have a serious impact on subsequent missions

For these anomalies, the following will be reported:

- (1) Description of the anomaly, the time in mission when it occurred, the possible mode or cause and the results of failure analysis, if available.
- (2) Criticality of the anomaly, the degree to which it compromised mission objectives and a clear identification of potential hardware and/or timeline effect on subsequent missions. Criticality categories of non-conformance are described in reference (a).
- (3) Identification of any testing required in support of corrective action, the schedule for the testing and whether it is a constraint on following missions.
- (4) Corrective action to be undertaken: This will include identification of required modifications, revisions to the qualification or certification testing or checkout activities; mission effectivity of any changes and a statement as to whether the anomaly is considered resolved or open. Anticipated closeout dates for anomaly corrective actions should be identified when practicable.

2. <u>Mission Operations Briefing</u> (KSC, MSC, MSFC)

A telecon briefing shall be conducted for the Skylab Program Director, and other management as required, subsequent to availability of the daily operations status report. These briefings shall be conducted daily during manned flight and weekly during unmanned flight. The briefing will start at 0830 local Houston time.

3. Mission Evaluation Reports

a. <u>Mission Operations Report, Headquarters</u>

This report will be issued one month before the Skylab l Mission. It will contain a description of mission flight operations and Skylab systems for the SL-1 through SL-4 Mission sequence.

b. Launch Operations Reports, KSC

Launch Operations Evaluation Reports will be submitted to the

Skylab Program Director and Program Managers one month after launch for each of the three launch operations activities; i.e., SL-1 and SL-2, SL-3 and SL-4. Each report will contain the following material:

- (1) Summary of major KSC flow events leading to the launch.
- (2) Atmospheric conditions during final countdown and launch.
- (3) Active GSE performance and condition assessment for subsequent launches.
- (4) Active GSE anomalies to the detail required in Section III.B.1.b. (Updates of these discrepancies will be required until they are closed out.)

c. MSC and MSFC Mission Evaluation Reports

These reports are to be submitted to the Skylab Program Director and Skylab Program Managers 90 days after SL-4 astronaut recovery. Each Centers' report will cover the flight hardware for which it has development responsibility and shall include:

- (1) Identification of flight hardware configuration, mission plan and sequential events compared with planned events.
- (2) Results and analysis of module systems, subsystems, and experiments performance.
- (3) A separate anomaly summary section as outlined in III.B.1.b. for each system and its subsystems and each experiment.
- (4) Results and analysis of Center ESE and GSE performance.

In addition to above, the MSC report should also include:

- (1) Recovery operations.
- (2) Results and analysis of MSFN command, tracking, communications, and data acquisition performance.

d. MSC and MSFC Preliminary Evaluation Reports for Revisit FRR's.

These reports are to be submitted to the Skylab Program Director and Program Managers at the SL-3 and SL-4 FRR's. Each Center's report will cover the flight hardware for which it has development responsibility. They are not to be formal final engineering evaluation reports but rather should be assembled from the real-time mission evaluation results required to support both the on-going mission and preparation for the revisit missions. They should therefore concentrate on the areas critical to subsequent

FRR's and will constitute an input to SL-3 and SL-4 FRR's. They should include:

- (1) The updated anomaly listings identified in III.B.1.b.
- (2) Results and analysis of on-board systems, experiments and center active GSE to the degree required to sustain the on-going flight mission and the revisit missions. (This should include the results of data trend analyses to the extent required to support subsequent mission operations.)

4. Preliminary Experiment Report (MSC, MSFC)

A Preliminary Skylab Mission Experiment Report will be submitted to the Skylab Program Director and Skylab Program Managers 90 days after astronaut recovery for each manned mission.

It will include the following data on experiments performed during the mission:

- a. Detailed descriptions and objectives of each scientific and engineering experiment performed during the mission.
- b. Results and analysis of the performance of each experiment including failures and anomalies.
- c. Preliminary analysis and interpretation of the data obtained from each experiment.

At the discretion of the Skylab Program Director, with the approval of the Administrator, the Mission Experiment Reports may be published as a NASA Special Publication.

The Centers are encouraged to conduct a symposium, the published proceedings of which could satisfy the requirements given above.

5. Experiment Reports (MSC, MSFC, LaRC, ARC, DOD, DOT (ERC))

The requirements for individual experiment scientific reports from the Principal Investigators are to be established by the sponsoring NASA organization as appropriate.

6. Launch Vehicle Reports (MSFC)

Reports on the performance of the launch vehicle will be submitted in accordance with the requirements of Apollo Program Directive APD 19C, given in Section III.B.5., Failures and Anomalies Listing Report, Section III.B.6., Final Mission Evaluation Report, and Section III.B.10., FRR and DCR Documentation.

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IV. MISSION EVALUATION MEETINGS (KSC, MSC, MSFC)

Flight crew debriefing and management briefings related to the mission evaluation effort will be scheduled by the Centers as required.

V. FLIGHT EVALUATION PRESENTATION TO THE MANAGEMENT COUNCIL

Preliminary results of the SL-2, SL-3 and SL-4 missions are to be summarized by Center Program Management at the Management Council Meeting following each mission.

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MISSION EVALUATION RE

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EVALUATION	MSC & MSFC MISSION EVALUATION REPORTS	Engineering final evaluation for SL-1 Through SL-4				
REPORTING	MSC & MSFC PRELIMINARY EVALUATION REPORTS FOR REVISIT FRRIS	SYSTEMS & EXPERIMENT EVALUATION TO DEGREE REQUIRED TO SUPPORT FLIGHT MISSIONS			. !	
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	SATURN EVALUATION REPORTS	ENGINEERING REPORT ON EACH LAUNCH VEHICLE				
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